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Oil and Gas Well Blowout Report

Events of 1990

ERCB

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ENERGY RESOURCES CONSERVATION BOARD
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1 SUMMARY

This is the seventh edition of this report. It contains information about drilling occurrences and a summary for each blow/blowout that occurred in 1990. The Board considers the publication of this information to be a constructive way to improve the level of understanding of many aspects of well control and drilling occurrences, and the ERCB role in this matter.

1990 Summary

In 1990, some 4307 wells were drilled by 445 active drilling rigs. A total of three blowouts and six blows occurred while drilling these wells. Further, among an active well population of approximately 94 000, nine well control incidents were reported during servicing operations and an additional fourteen incidents occurred at producing or suspended wells. Although minor amounts of sour gas were released during some of the incidents, there were no blows or blowouts at critical sour wells.

Further, an analysis of the 1990 individual incidents was completed. This analysis was conducted categorically based on the status of the well and the operation in progress at the time of the incident. The purpose of this analysis was to assess industry's performance with respect to well control during 1990.

Observations of special note made during the analysis were as follows:

DRILLING OPERATIONS

- Although the total number of incidents (blows and blowouts) was significantly lower than in 1989, it still remains above the 5-year average established prior to 1988. This average was approximately four incidents per year.
- Seven of the nine incidents occurred at depths less than 1000 m.
- Two incidents occurred while tripping.
- Hole problems including lost circulation and abnormal pressure were the main cause in five out of the nine incidents in 1990.

As in past years, improper tripping procedures and insufficient use of offset drilling and production information were the leading causes of kicks which lead to blows and blowouts. Initiatives have already been taken by the ERCB to create awareness about and to hopefully reduce the number of incidents resulting from these causes. These include a paper delivered at the 1991 CAODC/CADE Drilling Conference and discussions and correspondence with the Petroleum Industry Training Service.

SERVICING OPERATIONS

Well control incidents at servicing operations had no common theme although most were related in some way to human error.

Hopefully, continued efforts to increase the level of training for on-site personnel will help to improve their performance.

OTHER

Suspended/Inactive Wells

- All five well control incidents at suspended wells were caused by third-party damage.

  All of these incidents could probably have been prevented if security fencing had been installed as described in ERCB Interim Directive ID 90-4, Suspension Guidelines for Inactive Wells. The implementation of this directive should help to reduce the frequency of these incidents in the future.

Producing Wells

- Four of the eleven incidents were the result of casing failures at crude bitumen wells in steam flood projects.
- Most of the remaining incidents were caused by various wellhead component failures.

All four of the casing failures occurred in Esso Resources wells at Cold Lake. Esso has set up a task force to study the problem.

In addition to the annual review, a review of the past 10 years' incidents was conducted during 1990. The purpose of this review was to assess the effectiveness of the existing blowout prevention regulations. Consequently, several deficiencies were revealed. Following the review, a draft interim directive was prepared in which modifications to the existing requirements were proposed. The proposed changes focus on three key areas of well control: kick prevention, kick detection, and kick control. The draft directive is currently before the Drilling and Completions Committee (DACC) for their comments. The ERCB intends to implement the requirements in the directive by 1 January 1992, with formal enactment into the regulations by 1 January 1993.

Finally, because of the very low subscription rate of this report in recent years, the ERCB intends to end its publication with this edition. The information contained within the report will, however, still be available through the ERCB's Drilling and Production Department. In addition, all historical blows and blowouts have been entered on a PC database and are available from the ERCB's Information Services, Main Floor, Energy Resources Building.

Any parties that believes the Annual Report should continue to be published in its current form should register their concern by calling 297-8186.

2 DRILLING, SERVICING, AND OTHER OCCURRENCES

A historical summary of drilling occurrences encountered while drilling wells in 1990 for various depth categories are presented in Section 2.1.1.

Section 2.2 addresses blow and blowout occurrences for well servicing and other operations as well as drilling. The numbers of blow and blowout occurrences, along with the operation being conducted at the time of the occurrence, are summarized in Section 2.2.1. A summary of the causes of blows and blowouts by operation is presented in Section 2.2.2. The statistics for blowout occurrences by operation and for blowout occurrences involving the release of sour fluids for a 10-year period are shown in Sections 2.2.3 and 2.2.4 respectively.

A summary of each of the nine blow and twenty-three blowout occurrences in 1990 is presented in Section 2.3. Specific information provided includes the well location and the operations being conducted at the time of the occurrence, along with a brief description of the event, control procedures, cause, losses, injuries, and actions to prevent future occurrences. In some cases the exact cause and events leading to the occurrence are not fully known; however, the most probable or likely cause has been noted.

The Appendix provides the definitions of terms used in the drilling occurrence summaries in this report.

2.1 Drilling Occurrences - Drilling Operations Only

2.1.1 Historical Drilling Occurrences (including water flows) 1990 to 1982

KICKS

Depth (metres)	1990	1989	1988	1987	1986	1985	1984	1983	1982
0 - 750	61	75	79	60	61	94	60	48	58
751 - 1 800	82	64	104	122	95	148	109	79	48
1 801 - 3 600	53	36	82	40	60	89	75	56	31
3 601 - 6 000	4	2	9	8	2	8	4	1	3
6 001 +	0	0	0	0	0	0	0	0	0
Total	200	177	274	230	218	339	248	184	140

BLOWS

Depth (metres)	1990	1989	1988	1987	1986	1985	1984	1983	1982
0 - 750	1	5	0	1	0	0	0	0	1
750 - 1 800	5	1	1	0	2	2	0	2	3
1 801 - 3 600	0	0	0	0	0	0	0	1	2
3 601 - 6 000	0	0	0	0	0	0	0	0	0
Total	6	6	1	1	2	2	0	3	6

BLOWOUTS

Depth (metres)	1990	1989	1988	1987	1986	1985	1984	1983	1982
0 - 750	2	2	1	2	2	1	0	0	2
751 - 1 800	0	3	3	0	0	0	2	1	0
1 801 - 3 600	1	1	1	0	0	0	2	0	2
3 601 - 6 000	0	0	0	0	0	0	0	0	0
6 001 +	0	0	0	0	0	0	0	0	0
Total	3	6	5	2	2	1	4	1	4

LOST CIRCULATION

Depth (metres)	1990	1989	1988	1987	1986	1985	1984	1983	1982
0 - 750	883	655	934	873	859	1316	892	618	764
751 - 1 800	351	298	441	482	408	484	389	321	254
1 801 - 3 600	126	96	142	144	132	159	112	85	74
3 601 - 6 000	16	7	15	10	7	7	0	2	3
6 001 +	0	0	0	0	0	0	0	0	0
Total	1376	1056	1532	1509	1406	1966	1394	1026	1095

WATER FLOWS

Depth (metres)	1990	1989	1988	1987	1986	1985	1984	1983	1982
0 - 100	3	5	8	9	12	8	9	5	7
101 - 200	8	3	7	5	8	1	6	3	5
201 - 300	0	4	7	0	5	8	1	2	1
301 - 400	1	2	2	3	2	2	0	1	1
401 - 750	1	2	1	0	0	6	3	2	5
751 - 1 800	1	7	2	3	1	6	1	13	4
1 801 - 3 600	0	1	1	1	0	4	0	11	1
3 601 - 6 000	0	0	0	0	0	0	0	0	0
Total	14	24	28	21	28	35	20	37	24

Note: Changes to the statistics of previous years reflect updating to the ERCB data base.

2.2 Blow and Blowout Occurrences - Drilling, Servicing, and Other Operations

2.2.1 Blow and Blowout Occurrences - 1990 - All Operations

Operation	Blows	Blowouts
Drilling	6	3
Servicing	2	7
Other	1	13
Total	9	23

2.2.2 Causes of Blows/Blowouts - 1990

Occurrence	**Operation and Cause**
Blows — 9	Drilling — 6 Human error — 3 Abnormally pressured zone — 2 Inadequate cementing — 1
	Servicing — 2 Human error — 2
	Other — 1 Third-party damage — 1
Blowouts — 23	Drilling — 3 Human error — 1 Equipment failure — 1 Abnormal pressure — 1
	Servicing — 7 Human error — 5 Equipment failure — 1 Unknown — 1
	Other — 13 Equipment failure — 8 Third-party damage — 5
Total — 32	

2.2.3 Blow and Blowout Occurrences (Historical Statistics)1990 to 1981

	Blows		Blowouts			Total Blow/ Blowouts
	Drilling	Servicing & Other	Drilling	Servicing	Other	
1990	6	3	3	7	13	32
1989	6	9	6	7	5	33
1988	1	4	5	6	9	25
1987	1	5	2	2	13	23
1986	2	6	2	4	12	26
1985	2	5	1	6	15	29
1984	3	*3	4	4	7	18
1983	4	4	1	3	9	21
1982	6	8	4	4	8	30
1981	11	3	2	3	8	27
Total	39	50	30	46	99	264

---

* Prior to 1984 many servicing and other blows were not recorded.

2.2.4 Blowout Occurrences with Sour Fluids Released (Historical Statistics) 1990 to 1981

	Drilling			Servicing			Other		
	Sweet	Sour	Total	Sweet	Sour	Total	Sweet	Sour	Total
1990	3	0	3	5	2	7	11	2	13
1989	5	1	6	6	1	7	5	0	5
1988	4	1	5	6	0	6	8	1	9
1987	2	0	2	2	0	2	11	2	13
1986	2	0	2	3	1	4	11	1	12
1985	1	0	1	5	1	6	11	4	15
1984	4	0	4	4	0	4	5	2	7
1983	0	1	1	2	1	3	8	1	9
1982	3	1	4	1	3	4	7	1	8
1981	1	1	2	2	1	3	7	1	8
Total	27	6	33	36	10	46	84	15	99

2.3 Blow/Blowout Summaries of Each Occurrence - 1990

A summary of each of the 32 blow/blowout occurrences for 1990 is presented in the following tabulations. The definitions regarding the type of occurrences and the operations at the time of the occurrences are provided in the Appendix.

BLOW/BLOWOUT SUMMARY

WELL NAME: ALTANA CAROLINE 4-3-35-6

LOCATION: 00/04-03-035-06W5/0 **LICENCE NO.:** 0134626

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 9 JAN 1990 **DURATION:** 3.5 hrs.

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: ALTANA EXPLORATION COMPANY

CONTRACTOR: FRONTIER WELL SERVICE RIG #2

FORMATION: BASAL QUARTZ "A" **DEPTH:** 2906 - 2909 m

FORMATION PRESSURE: 12 000 **kPa** **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING GAS WELL.

DESCRIPTION OF EVENT: The pressure on the well was being bled off to a service rig tank. Approximately five minutes after the valve in the bleed-off line was opened, an explosion occurred within the bleed-off line, completely destroying it and igniting the condensate in the rig tank, and the gas and condensate flowing from the well.

CONTROL PROCEDURES: After the fires were extinguished and the wellhead and service rig equipment cooled off, the bleed-off line valve at the wellhead was closed. The bleed off line, leaked slightly. The annular preventer was removed, a full opening valve and lubricator installed, and a wireline bridge plug run in and set above the perforations. The well was then bled off and the casing filled with water.

CAUSE OF BLOW/BLOWOUT: It is believed that air in the wellbore mixed with the natural gas and condensate formed an explosive mixture which ignited in the bleed-off line between the well and rig tank. The ignition source is undertermined, it is speculated that static electricity or compression ignition may be the cause.

ACTIONS TO PREVENT FUTURE OCCURRENCES: The licensee will initiate a policy, utilizing low-flash point hydrocarbons on wells where the formations encountered are highly sensitive and require specific workover fluids. Additional precautions will be taken to ensure adequate equipment is in place to handle the fluids safely during workover operations.

HYDROCARBON AND/OR EQUIPMENT LOSS: Approximately 6 m^3 condensate and 1000 m^3 sweet gas. Fire damaged BOP stack and rig tank and destroyed the bleed-off line.

INJURIES: 5 men sustained burns.

BLOW/BLOWOUT SUMMARY

WELL NAME: AMOCO ET AL GRAND FORKS 9-20-11-13

LOCATION: 00/09-20-011-13W4/0 **LICENCE NO.:** 0145966

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 26 NOV 1990 **DURATION:** 24 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: AMOCO CANADA PETROLEUM COMPANY LTD.

CONTRACTOR: CHAMPION DRILLING LTD. RIG #3

FORMATION: MANNVILLE **DEPTH:** 858 m

FORMATION PRESSURE: 20 000 **kPa** **or DRILLING FLUID DENSITY:** 2380 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: Upon penetration of the Mannville formation a kick occurred. Since the MACP was exceeded the flow was directed to flare. It became readily apparent that the Mannville formation was being affected by a nearby pressure maintenance system.

CONTROL PROCEDURES: Circulate kill mud with back pressure. The well was then abandoned with cement plugs.

CAUSE OF BLOW/BLOWOUT: Possible charging of uphole zones by nearby injection wells.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Better offset well research to be conducted.

HYDROCARBON AND/OR EQUIPMENT LOSS: None.

INJURIES: NONE.

BLOW/BLOWOUT SUMMARY

WELL NAME: AMOCO HAIGHT 13-9-52-16

LOCATION: 00/13-09-052-16W4/0 **LICENCE NO.:** 0093097

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 2 OCT 1990 **DURATION:** 17 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: AMOCO CANADA PETROLEUM COMPANY LIMITED

CONTRACTOR: N/A

FORMATION: BASAL QUARTZ **DEPTH:** PERFS: 862.2 - 863.4 m

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: While collecting bales in the field, a farmer hit the well with his tractor shearing off the tubing bonnet below the master valve.

CONTROL PROCEDURES: A high pressured pumping unit tied into the casing valve and pumped salt water down the casing until the flow from the well was killed.

CAUSE OF BLOW/BLOWOUT: Third party damage.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Fence or wellhead guards will be installed around the well.

HYDROCARBON AND/OR EQUIPMENT LOSS: 8 10^3m^3 of sweet dry gas. Damaged wellhead.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: AMOCO LINDBERGH 13A-12-56-6

LOCATION: 100/13-12-056-06W4M/2 **LICENCE NO.:** 010307

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 22 MAY 1990 **DURATION:** 3 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: AMOCO CANADA PETROLEUM CO. LTD.

CONTRACTOR: LEYEN OILWELL SERVICING LTD. RIG #34

FORMATION: CUMMINGS MEMBER **DEPTH:** 602 - 607 m

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING CRUDE BITUMEN WELL.

DESCRIPTION OF EVENT: The service rig was pulling the 88.9 mm production tubing from the well in preparation for abandonment of a lower formation. Three joints of pipe were left to pull when a kick occurred and the well blew in through the tubing.

CONTROL PROCEDURES: The stabbing valve could not be installed due to the initial flow. The casing valves were opened to help depressure well. A pressure truck was tied into the casing annulus and pumped kill fluid into the well. When the flow was sufficiently reduced, the stabbing valve was installed and the well was shut-in.

CAUSE OF BLOW/BLOWOUT: Human error. Inadequate hole filling procedures while tripping out the tubing.

ACTIONS TO PREVENT FUTURE OCCURRENCES: On heavy oilwells with any show of gas, a constant volume of fluids will be pumped into the well during tripping.

HYDROCARBON AND/OR EQUIPMENT LOSS: All volumes are estimated - 1 m^3 produced water, 1 m^3 produced oil, 28.2 x 10^3m^3 of natural gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: AMOCO PEMBINA 14-8-47-9

LOCATION: 00/14-08-047-09w5/0 **LICENCE NO.:** 0016092

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 5 NOV 1990 **DURATION:** 1 MINUTE

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: AMOCO CANADA PETROLEUM LTD.

CONTRACTOR: BRANDETTE WELL SERVICING RIG #6

FORMATION: CARDIUM **DEPTH:** 1740 - 1741.9 m

FORMATION PRESSURE: or DRILLING FLUID DENSITY: 1000 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: WATER INJECTION WELL.

DESCRIPTION OF EVENT: While drilling out a hydrate plug, at a depth of 581 m K.B., a large gas kick was encountered. An immediate condition of underbalance caused the workover fluids and bit-casing scraper-tubing to be blown out of the hole.

CONTROL PROCEDURES: When the bottomhole assembly cleared the well and landed on the ground, the blind rams on the BOPs were closed on the gas water flow and this flow was diverted to the rig tank through the work spool valve and line. The working spool valve was closed, shutting-in the well.

CAUSE OF BLOW/BLOWOUT: Human error - incorrect procedure or judgement.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Recognize the possibility of a high pressure accumulation in formations which have experienced gas injection. All operations conducted on wells in these areas should utilize the appropriate equipment that could handle such situations.

HYDROCARBON AND/OR EQUIPMENT LOSS: Kelly hose, tubing board, 61 joints of 60.3 mm tubing.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: AQUIT ET AL RAINS 11-32-107-9

LOCATION: 00/11-32-107-09W6/0 **LICENCE NO.:** 0057889

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 26 DEC 1990 **DURATION:** 12 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: HUSKY OIL

CONTRACTOR:

FORMATION: KEG RIVER A **DEPTH:** 1886 - 1916 m

FORMATION PRESSURE: **kPa** **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING OIL WELL.

DESCRIPTION OF EVENT: The existing high pressure shutdown switch on the wellhead failed when an emergency shutdown was initiated at a nearby satellite. Wellbore fluid leaked passed the stuffing box. The fluid ignited and caught on fire.

CONTROL PROCEDURES: A high pressure pumping unit tied into the casing valve on the wellhead and pumped water down the casing annulus to kill the well. The fire was extinguished by blocking in the backflow line from the satellite flowline and closing the casing valve.

CAUSE OF BLOW/BLOWOUT: Mechanical failure.

ACTIONS TO PREVENT FUTURE OCCURRENCES: The company will set up a maintenance program to ensure the high pressure shut downs are function tested on a regular basis.

HYDROCARBON AND/OR EQUIPMENT LOSS: Undertermined volume of H_2S (3.6%) gas released. Wellhead equipment was damaged along with wiring and various pumpjack components.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: AQUIT MOBIL RAINS 4-12-108-10

LOCATION: 00/04-12-108-10W6M/3 **LICENCE NO.:** 0032142

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 17 JAN 1990 **DURATION:** 4 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: HUSKY OIL OPERATIONS

CONTRACTOR: N/A

FORMATION: MUSKEG **DEPTH:** 1809.9 - 1856.5 m

FORMATION PRESSURE: **kPa** **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING OIL WELL.

DESCRIPTION OF EVENT: An apparent stuffing box leak occurred allowing oil and gas to flow freely from the well. Ignition of the oil and gas followed.

CONTROL PROCEDURES: Flowing the well to an existing satellite reduced the pressure, enabling the licensee to direct the extinguishing of the fire. A pumping unit was then tied into the casing/tubing annulus and pumped salt water down the well to kill the flow.

CAUSE OF BLOW/BLOWOUT: Equipment failure.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Unable to make recommendation until the exact cause of the blow is determined.

HYDROCARBON AND/OR EQUIPMENT LOSS: Small volume of gas, .5 m^3 of oil/wellhead and pumpjack.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: BANKENO BRENDA ENCHANT 1-28-14-17

LOCATION: 00/1-28-014-17W4M/0 **LICENCE NO.:** 0077010

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 13 JUL 1990 **DURATION:** 18 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: BANKENO RESOURCES LTD.

CONTRACTOR: N/A

FORMATION: GLAUCONITIC SS **DEPTH:** 1026.5 - 1027 m

FORMATION PRESSURE: 11400 **kPa** **or DRILLING FLUID DENSITY:** N/A

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: A farm implement contacted the wellhead and knocked off the master valve causing the well to flow through the tubing uncontrolled to atmosphere.

CONTROL PROCEDURES: High pressured pumping units tied into a valve on the casing side of the tubing head and pumped KCL water down the annulus. Well was dead within 30 minutes of initiating pumping operations.

CAUSE OF BLOW/BLOWOUT: Third party damage – master valve knocked off above tubing bonnet allowing well to flow.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure wellheads are clearly visible.

HYDROCARBON AND/OR EQUIPMENT LOSS: 84 x 10^3 m^3 sweet gas – salt water spray also. Rehabilitation program to follow.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: BA PAN AM SONJA SWANH 4-14-65-11

LOCATION: 00/04-14-065-11W5/0 **LICENCE NO.:** 0021778

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 4 JUN 1990 **DURATION:** 4.5 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: GULF CANADA LIMITED

CONTRACTOR: N/A

FORMATION: BEAVERHILL LAKE **DEPTH:** 2550 m

FORMATION PRESSURE: 22000 kPa **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING OIL WELL.

DESCRIPTION OF EVENT: The "O" rings between the hammer cap and tubing hanger on the wellhead had worn, this allowed fluid to escape and spray over the lease.

CONTROL PROCEDURES: A weighted fluid was pumped down the casing and tubing to kill the well.

CAUSE OF BLOW/BLOWOUT: Equipment failure. Failed "O" rings on electric submersible pump's wellhead.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Scheduled maintenance checks.

HYDROCARBON AND/OR EQUIPMENT LOSS: 3 m^3 of oil stained water.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: BP ET AL POUCE COUPE

LOCATION: 00/14-04-081-13W6/0 **LICENCE NO.:** 0095676

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 23 JUL 1990 **DURATION:** 20 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: BP RESOURCES CANADA LIMITED

CONTRACTOR: THOMPKINS CONSTRUCTION

FORMATION: KISKATINAW **DEPTH:** 2417.5 - 2420.5 m

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: An earth mover was working close to a wellhead when the ground gave way. The earth mover slipped against the wellhead, contacting the master valve and flow tee. Gas began escaping between the flanged connection of the lower master valve and tubing bonnet.

CONTROL PROCEDURES: The bolts holding the tubing bonnet to the master valve were tightened, eliminating the flow, the earthmover was skidded from the area.

CAUSE OF BLOW/BLOWOUT: Third party damage.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Caution should be taken when working around lease with heavy equipment.

HYDROCARBON AND/OR EQUIPMENT LOSS: 28 x 10^3 m^3 of gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: BP UNIT 2 CHAUVS 16-27-42-2

LOCATION: 00/16-27-042-02W4/0 **LICENCE NO.**: 0143880

OCCURRENCE:

BLOW: **BLOWOUT**: X **DATE**: 2 JUN 1990 **DURATION**: 9 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING**: **OTHER**:

LICENSEE: BP RESOURCES CANADA LTD.

CONTRACTOR: SEDCO DRILLING RIG #83

FORMATION: SPARKY **DEPTH**: 666 m

FORMATION PRESSURE: 13 000 **kPa** or **DRILLING FLUID DENSITY**:

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: While drilling ahead in the Sparky formation an influx occurred. The well was shut in. Weighted mud was mixed and circulated. Subsequently the drill string became stuck. Continued circulations to kill the well were complicated by lost circulation and an underground flow.

CONTROL PROCEDURES: Continue to increase mud weight in increments until well was static at 1935 kg/m^3. Attempted to spot weighted cement plug across Sparky interval, but well started to flow again. Mix mud and circulate until well was killed at 2320 kg/m^3. Abandon the well with cement.

CAUSE OF BLOW/BLOWOUT: Unexpected high pressure Sparky sand which was pressure supported by a near by water injector.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Exercise more attention when drilling in a water flood area and have the near-by injectors shut-in prior to drill operation commencing.

HYDROCARBON AND/OR EQUIPMENT LOSS: 12 joints of drill collar.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: CANTERRA ET AL RICINW 11-33-35-10

LOCATION: 00/11-33-035-10W5/0 **LICENCE NO.:** 0141579

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 8 FEB 1990 **DURATION:** 4 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: CANTERRA ENERGY LTD.

CONTRACTOR: NOBLE DRILLING (CANADA) LTD. RIG #21

FORMATION: NISKU/CAMBRIAN **DEPTH:** 1055 - 1670 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:** 1070 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: Intermediate casing was cemented and set at 4075 m. While tripping in the hole at a drilled depth of 4406 m a gas and liquid blow occurred in the cellar.

CONTROL PROCEDURES: Manifold, kill and flare lines were tied into the surface casing vent. The vent valve was then closed. The shut-in pressure rapidly approached the MACP so gas was directed to flare. Drilling assembly was tripped out of hole. Logs determined source of influx. Kill mud was pumped down the annulus and after a few stages the gas flow stopped.

CAUSE OF BLOW/BLOWOUT: Inadequate primary cementing — low cement top allowed shallow formation to flow.

ACTIONS TO PREVENT FUTURE OCCURRENCES: The primary cementing program should ensure that all potential hydrocarbon zones are covered by cement.

HYDROCARBON AND/OR EQUIPMENT LOSS: 36 x 10^3 m^3/d sour gas (1.04% H_2S), and approximately 170 m^3 of fluid.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: CHEVRON ET AL VENUS

LOCATION: 00/10-18-100-8 W6/0 **LICENCE NO.:** 0125964

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 24 JAN 1990 **DURATION:** 15 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: CHEVRON CANADA RESOURCES

CONTRACTOR: WIDNEY WELL SERVICE RIG #58

FORMATION: DEBOLT **DEPTH:** 822 - 844 m

FORMATION PRESSURE: 5 500 kPa **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING GAS WELL.

DESCRIPTION OF EVENT: Chevron was foam drilling with a 73 mm tubing string to clean out fill in a 114 mm "scab liner". The liner and liner hanger hydraulically lifted out of hole due to differential pressure across the hanger. The liner moved up hole and lodged in the rotating head on the service rig floor. Sweet dry gas flowed uncontrolled out through tubing/casing annulus.

CONTROL PROCEDURES: A high pressure pumping unit and service rig pump were tied into the tubing/casing annulus and pumped 27.5 m^3 water down the annulus to kill the flow.

CAUSE OF BLOW/BLOWOUT: 1. Human error – not anticipating pressure differential across liner.
2. Movement of liner up hole, lodging in the rotating head of the service rigs BOPs.

ACTIONS TO PREVENT FUTURE OCCURRENCES: A bi-directional anchor system for liner hangers/or cementing liner hangers, should be considered on future wells of this nature.

HYDROCARBON AND/OR EQUIPMENT LOSS: 50 x 10^3 m^3 sweet gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: COHO BARRINGTON LONGCO 5-12-17-21

LOCATION: 00/05-12-017-21W4/0 **LICENCE NO.:** 0141869

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 6 FEB 1990 **DURATION:** 7 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: COHO RESOURCES LIMITED

CONTRACTOR: WILCO WIRELINE SERVICES

FORMATION: BASAL QUARTZ **DEPTH:** 1347 m

FORMATION PRESSURE: 10 500 kPa **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING GAS WELL.

DESCRIPTION OF EVENT: While obtaining a static gradient the adapter below the master valve was broken off allowing gas to flow from the tubing to atmosphere.

CONTROL PROCEDURES: A crane was utilized to remove existing broken flange and to lower a new flange and master valve in place.

CAUSE OF BLOW/BLOWOUT: High impact load due to lubricator not having sufficient stabilization caused failure of wellhead.

ACTIONS TO PREVENT FUTURE OCCURRENCES: More stabilization of lubricator during future wire line work and closer inspection of used wellhead equipment.

HYDROCARBON AND/OR EQUIPMENT LOSS: The equipment loss consisted of a wireline lubricator and top portion of wellhead. Hydrocarbon loss was estimated to be 85 10^3m^3 of gas with an H_2S content of approximately 0.3%.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: DOME CDA VALHALLA 6-11-75-10

LOCATION: 00/06-11-075-10W6/0 **LICENCE NO.**: 0091623

OCCURRENCE:

BLOW: **BLOWOUT**: X **DATE**: 12 NOV 1990 **DURATION**: 1 DAY

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING**: **OTHER**: X

LICENSEE: ENCOR ENERGY CORPORATION INC.

CONTRACTOR: PARTECH CONSTRUCTION

FORMATION: DOE CREEK **DEPTH**: 707 - 713

FORMATION PRESSURE: or **DRILLING FLUID DENSITY**:

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING GAS WELL.

DESCRIPTION OF EVENT: A piece of heavy equipment struck a flowline near the well, forcing the associated piping to strike the wellhead. The impact caused a separation of the threaded connection between the tubing bonnet and the lower master valve, gas began leaking at the separation point.

CONTROL PROCEDURES: A pressurized pumping unit tied into the wellhead casing annulus and pumped KCL water to kill the flow.

CAUSE OF BLOW/BLOWOUT: Third party damage – master valve was partially separated from tubing bonnet.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Adequate supervision must be provided when heavy equipment is working near wellhead and associated equipment.

HYDROCARBON AND/OR EQUIPMENT LOSS: Hydrocarbon volume unknown, replace tubing bonnet and master valve.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: ESSO 85 D23-6 COLDLK 16-02-065-04

LOCATION: 03/16-02-065-04W4M **LICENCE NO.:** 0116114

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 20 JAN 1990 **DURATION:** 14 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: ESSO RESOURCES CANADA LTD.

CONTRACTOR:

FORMATION: CLEARWATER **DEPTH:** 505 - 509 m

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING CRUDE BITUMEN (STEAM CYCLIC).

DESCRIPTION OF EVENT: 19 January 1990 – Steam injection pressure had dropped from 10 190 to 3050 kPa at D23-6 well. 20 January 1990 – underground blowout occurred which eventually broached to surface near D23-0B1 well.

CONTROL PROCEDURES: Steaming operations on D23 pad were stopped. Wells were allowed to flow back until it was safe to move a rig on the hole. Nitrogen pressure was maintained on the casing side of D23-6 well to insure that no more formation fluids could escape through the casing break.

CAUSE OF BLOW/BLOWOUT: Casing failure at approximately +200 M allowed steam to migrate to surface.

ACTIONS TO PREVENT FUTURE OCCURRENCES: All the casing of all the wells on D23 production pad will be inspected prior to initiating steam operations.

HYDROCARBON AND/OR EQUIPMENT LOSS: 500 m^3 steam, 100-150 m^3 water.

INJURIES: No injuries reported.

BLOW/BLOWOUT SUMMARY

WELL NAME: ESSO L6 LEMING ETHELLK EX 8-5-65-3

LOCATION: AA/08-05-065-03W4/0 **LICENCE NO.:** 0079207

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 13 AUG 1990 **DURATION:** 1.25 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: ESSO RESOURCES CANADA LIMITED

CONTRACTOR: N/A

FORMATION: CLEARWATER **DEPTH:** 556 - 564 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: SUSPENDED CRUDE BITUMENT (STEAM CYCLIC)

DESCRIPTION OF EVENT: Steam operations at an adjacent pad flowed through the formation to this existing suspended wellbore. The flow migrated up through the perforations and flowed out through corroded holes in the casing near surface (casing failure).

CONTROL PROCEDURES: Operations were initiated to snub out the continuous sucker-rod string. A high pressure pump unit was tied into the wellhead and pumped weighted mud into the annulus to kill the flow.

CAUSE OF BLOW/BLOWOUT: Zonal communication in the formation between existing pads and the leaking casing in this well.

ACTIONS TO PREVENT FUTURE OCCURRENCES: An internal evaluation of existing wellbore conditions on thermal wells producing and shut-in is presently being conducted by the licensee.

HYDROCARBON AND/OR EQUIPMENT LOSS: Approximately 8 m^3 oil, 65 m^3 produced water and a small volume of gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: ESSO P-10 LEMING ETHELLK EX 9-5-65-3

LOCATION: AE/09-05-065-03W4M **LICENCE NO.:** 0080880

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 18 JAN 1990 **DURATION:** 12 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: ESSO RESOURCES CANADA LTD.

CONTRACTOR:

FORMATION: CLEARWATER **DEPTH:** 550 - 558 m

FORMATION PRESSURE: **kPa or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: SUSPENDED CRUDE BITUMEN (STEAM CYCLIC).

DESCRIPTION OF EVENT: Steam injection was shut off to the existing pad, which contained the wellhead. At 01:30 18 January 1990 to depressure the formation for maintenance work. It was observed 08:00 that steam was coming out of the ground in front of the well.

CONTROL PROCEDURES: 19 January 1990 – flowed well P-10 up the tubing to depressure well and shut-in due to safety precautions. On 6 January 1990, cold water was pumped down the casing to reduce the temperature and pressures. 06-29 January 1990 – pumped cold water down tubing.

CAUSE OF BLOW/BLOWOUT: A casing failure at approximately 30 m K.B. This failure allowed steam to migrate to surface.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Company will have failure material analyzed and submit its findings and recommendations to the ERCB.

HYDROCARBON AND/OR EQUIPMENT LOSS: 1500 - 2000 m^3 steam.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: ESSO U 20 LEMING ETHELLK EX 7-8-65-3

LOCATION: AM/07-08-065-03W4/0 **LICENCE NO.:** 0094826

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 27 AUG 1990 **DURATION:** 52 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: ESSO RESOURCES CANADA LTD. (COLD LAKE OPERATION)

CONTRACTOR:

FORMATION: CLEARWATER **DEPTH:** 560 - 568

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING CRUDE BITUMEN (STEAM CYCLIC).

DESCRIPTION OF EVENT: Steam and mud eruptions were seen on the U pad. All of the wells on the pad were immediately flowed back to prevent further blowouts. Several attempts were made to identify the well with the casing failure by injecting nitrogen down the casing. As a result of these and other operations two new blowouts occurred at surface.

CONTROL PROCEDURES: Identify blowout well, snubbed the pump and continuous rod out of the hole. Then kill the well with mud. The existing perforations were cemented off with the tubing remaining in the hole.

CAUSE OF BLOW/BLOWOUT: Casing failure.

ACTIONS TO PREVENT FUTURE OCCURRENCES: A casing failure task force has been set up to study the cause of casing failures.

HYDROCARBON AND/OR EQUIPMENT LOSS: Estimated 225 m^3 produced water and estimated 50 m^3 fresh water.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: GARDINER UPRI WILD RIVER 2-21-56-23

LOCATION: 00/02-21-056-23W5/0 **LICENCE NO.:** 0141890

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 1 JAN 1990 **DURATION:** 3 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: GARDINER OIL AND GAS LTD.

CONTRACTOR: CACTUS DRILLING & EXPLORATION LTD. RIG #21

FORMATION: VIKING **DEPTH:** 2668.5 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:** 1105 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: Drilling to core point underbalanced. Decided to circulate up bottom hole sample and check for core point. Geologist noted gas detector reading increased. Flow check conducted. Well flowing. Casing pressure at MACP, directed flow to flare. Surface casing just below bowl ruptured. Mud and gas flowed from ruptured surface casing.

CONTROL PROCEDURES: Mixed kill mud to 1300 Kg/m^3 and pumped down the drill pipe to kill the well. Installed storm valve, exposed ruptured joint, backed out and replaced joint, cemented and pressure tested.

CAUSE OF BLOW/BLOWOUT: Inadequate mud density caused kick. The blowout was caused by excessive casing wear under the casing bowl due to a bent kelly.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure adequate mud density exists.

HYDROCARBON AND/OR EQUIPMENT LOSS: Approximately 28.2 x 10^{3}m^3 sweet gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: GLEN ISLE ET AL MITSUE 14-12-73-4

LOCATION: 00/14-12-073-04W5/0 **LICENCE NO.**: 0143543

OCCURRENCE:

BLOW: X **BLOWOUT**: **DATE**: 11 MAR 1990 **DURATION**: 1 DAY

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING**: **OTHER**:

LICENSEE: GLEN ISLE EXPLORATION LTD.

CONTRACTOR: DERRICK DRILLING LTD. #2

FORMATION: WINTERBURN **DEPTH**: 1041 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY**: 1060 Kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: Drilling ahead from 993 m with lost circulation. At 1041 m drilling was suspended, one joint of drill pipe was pulled and deviation survey was run when a gas flow was noted. Closed the annular, cut the survey line, installed the stabbing valve and directed the well to the flare pit.

CONTROL PROCEDURES: The kelly was installed and water was pumped down the drill pipe. Gas flow stopped.

CAUSE OF BLOW/BLOWOUT: The reduced hydrostatic head in the well, due to lost circulation, allowed a shallow gas sand to flow into the wellbore.

ACTIONS TO PREVENT FUTURE OCCURRENCES: If drilling blind is required, all hydrocarbon bearing zones above the lost circulation zone should be cased off. In addition, a rotating head should be considered while drilling in the area.

HYDROCARBON AND/OR EQUIPMENT LOSS: Small amount of sweet gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: HOME ET AL NEVIS 14-2-39-22

LOCATION: 00/14-2-039-22W4M/0 **LICENCE NO.:** 0004607

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 25 JUL 1990 **DURATION:** 8 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: HOME OIL COMPANY LTD.

CONTRACTOR: NOWSCO WELL SERVICE LTD.

FORMATION: OSTRACOD **DEPTH:** 1357.0 - 1358.5 m

FORMATION PRESSURE: 10 000 **kPa** **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING GAS WELL.

DESCRIPTION OF EVENT: A coiled tubing unit was rigged up to pull out the tubing string from inside the production tubing. Four dognut ports were left open below the BOPs above the lower packing. After pulling 60 m of tubing, the lower packing failed allowing gas to blow out the open dognut ports.

CONTROL PROCEDURES: A mixture of synthetic nylon material, rags, and sealing mud was pumped through the flowline into the production tubing to seal off the dognut ports. Weighted KCL water was pumped into the production tubing to top kill the well. This was not successful due to extremely slow gas bubble migration up the tubing. The rags extruding from the ports were cut away allowing the installation of nipples and valves on the ports. The coiled tubing was pulled out and the master valve then closed.

CAUSE OF BLOW/BLOWOUT: Human error. The dognut ports were not properly secured.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure wellbore is completely secure before beginning workover operations.

HYDROCARBON AND/OR EQUIPMENT LOSS: No equipment loss. Estimate of hydrocarbon loss will be submitted at a future date.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: MOBIL DUHAMEL 15-20-45-21

LOCATION: 00/15-20-045-21W4/2 **LICENCE NO.:** 0138543

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 10 APR 1990 **DURATION:** 2 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: MOBIL OIL CANADA LTD.

CONTRACTOR: N/A

FORMATION: NISKU/LEDUC **DEPTH:** 1361 - 1363/1447 - 1450 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: PUMPING OIL WELL (DUAL ZONE).

DESCRIPTION OF EVENT: The down-hole rod-pump (Nisku formation) seized. This in turn, hung up the reciprocating rod assembly, allowing the horsehead to strike the polish rod, re-aligning the rod against the screw pump assembly (Leduc formation). The bonnet assembly below the rod BOPs cracked allowing well effluent to escape.

CONTROL PROCEDURES: A pressure truck tied into the tubing (Nisku) and pumped fresh water down the tubing and killed the zone. The Leduc formation was diverted through a flowline, however, the hydrostatic fluid column of the tubing loaded up and was sufficient to kill the flow from the formation.

CAUSE OF BLOW/BLOWOUT: Equipment failure. The down-hole rod pump seized and continuous action of the horse head rocking back and forth instigated further damage to the wellhead components.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Install vibration switches on pump jack to initiate immediate shut down.

HYDROCARBON AND/OR EQUIPMENT LOSS: 1 m^3 emulsion, 5 10^3m^3 of (1% sour gas). Repair horse head; damaged wellhead equipment.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: MOBIL RAINBOW 1-14KR-110-6

LOCATION: 02/01-14-110-06W6/0 **LICENCE NO.:** 142440

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 05 OCT 1990 **DURATION:** 30 SECONDS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: MOBIL OIL CANADA LTD.

CONTRACTOR: ATLAS WIRELINE LOGGING & CANADIAN FRACMASTER (COIL TUBING)

FORMATION: KEG RIVER **DEPTH:** 1782 - 2225 m

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: FLOWING OIL WELL.

DESCRIPTION OF EVENT: While retreiving the logging tools, the coiled tubing operator proceeded to pull the coiled tubing out of the wellbore. Inadvertantly, the coiled tubing operator pulled the tubing above the stripper rubber into the injection head, which allowed gas to be released through the coiled tubing injector head.

CONTROL PROCEDURES: The well was secured by closing the remote operated Hydril BOP. The gas flow had blown the coiled tubing out of the well and the operator closed the blind rams. The wellhead master valve was then shut.

CAUSE OF BLOW/BLOWOUT: Human error -- the operator erred by not stopping at the predetermined reel odometer depth.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Install a tubing stop system to prevent the coil tubing from being pulled above the stripper rubber.

HYDROCARBON AND/OR EQUIPMENT LOSS: No equipment loss; less than 0.1 m^3 oil liquids and approximately 10 m^3 gas.

INJURIES: One injury.

BLOW/BLOWOUT SUMMARY

WELL NAME: MORRISON RETLAW 4-30-12-17

LOCATION: 00/04-30-012-17W4/0 **LICENCE NO.:** 0144229

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 30 MAY 1990 **DURATION:** 8 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: MORRISON PETROLEUMS LTD.

CONTRACTOR: BLUEBIRD DRILLING LTD. RIG #2

FORMATION: MILK RIVER **DEPTH:** 830 m

FORMATION PRESSURE: 2000 **kPa** **or DRILLING FLUID DENSITY:** 1000 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: Well was flowing a little during trip out, crew felt gas was coming from Milk River formation a normal occurrence. Flow check was written on trip sheet at this point. With the collars out of the hole, the well blew in.

CONTROL PROCEDURES: Well was shut-in and flow directed through the manifold and degasser to the flare pit. Approximately 100 sacks of Barite were mixed at 1.5 min/sack. "Top killed the well." Pump kill weight mud – bleed off pressure, pump 4 m^3 – bleed off pressure, continued until shut-in pressure equals "0". Trip in drill pipe and circulate out entrained gas.

CAUSE OF BLOW/BLOWOUT: Improper tripping procedures.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure adequate mud density exists before beginning trip. Do not trip when well is flowing.

HYDROCARBON AND/OR EQUIPMENT LOSS: Less than 14 x 10^3m^3 sweet gas, with a small amount of produced water to flare pit.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: NORWICH OPINAC FARMINGTON 06-35

LOCATION: 00/06-35-080-11W6M **LICENCE NO.:** 0144346

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 31 AUG 1990 **DURATION:** 19.5 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: NORWICH RESOURCES CANADA LTD.

CONTRACTOR: DRIVE WELL SERVICING LTD. #10

FORMATION: KISKATINAW **DEPTH:** PERF: 2302 - 2314 m

FORMATION PRESSURE: 22 500 **kPa** **or DRILLING FLUID DENSITY:** UNKNOWN

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: The service rig had set a tubing plug in the nipple of the "on-off" tool. The tubing disengaged and was pulled up until the dognut was unseated. The stabbing valve was removed to allow removal of the dognut and pup joint, when the well blew in.

CONTROL PROCEDURES: The annular BOP was closed on the tubing, pumping units tied into both valves on the wellhead and pumped heavy water down the annulus to kill the flow.

CAUSE OF BLOW/BLOWOUT: Mechanical failure of the packer mandrel. Physical inspection of packer confirms the failure.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Company will assess quality assurance programs to determine future completion procedures.

HYDROCARBON AND/OR EQUIPMENT LOSS: Approximately 2-3 10^3m^3 gas and small amount of condensate.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: NOVALTA ET AL NAMAKA 13-16-22-24

LOCATION: 00/13-16-022-24W4M/0 **LICENCE NO.:** 0135005

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 11 JUL 1990 **DURATION:** 10 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: NOVALTA RESOURCES LTD.

CONTRACTOR: N/A

FORMATION: BELLY RIVER **DEPTH:** 721 - 726.5 m

FORMATION PRESSURE: 2500 kPa **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: A farmer's implement struck an existing wellhead, shearing off the casing valve and allowing the well to flow uncontrolled.

CONTROL PROCEDURES: A high pressure pumping unit tied into the tubing and commenced pumping KCI fluid down the tubing. Well was dead in several minutes – a new valve was installed.

CAUSE OF BLOW/BLOWOUT: Third party damage – casing valve damaged allowing well to flow.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Fence or guards will be installed around wellhead.

HYDROCARBON AND/OR EQUIPMENT LOSS: 14.1 x 10^3m^3 gas – no liquids produced.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: PCI UNIT GREENCOURT 10-9-59-9W5M

LOCATION: 00/10-09-059-09W5M **LICENCE NO.:** 0034467

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 18 JUL 1990 **DURATION:** 1.25 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** X **OTHER:**

LICENSEE: PETRO-CANADA INC.

CONTRACTOR: GALA WELL SERVICE RIG #2

FORMATION: NORDEGG **DEPTH:** PERFS: 1461.5 - 1467.9

FORMATION PRESSURE: **or DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: SUSPENDED GAS WELL.

DESCRIPTION OF EVENT: While removing wellhead to install BOPs, the pressure of the well blew the dognut out of the hole. (Improper installation of dognut.) One joint of tubing immediately below wellhead was bent.

CONTROL PROCEDURES: Pull one joint of tubing above wellhead and break the connection to remove wellhead, dognut, and the one bent joint of tubing. A new tubing bonnet was installed on the tubing string, and the string was stripped on and secured on the tubing spool. A wellhead was installed and securred in the bonnet. The annulus valve was closed to stop the flow.

CAUSE OF BLOW/BLOWOUT: Human error. Dognut was not properly landed and secured when the well was originally completed.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure proper installation of wellhead equipment by personnel who have been adequately trained.

HYDROCARBON AND/OR EQUIPMENT LOSS: 75 10^3 m^3 of gas (trace H_2S), 1 m^3 condensate.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: PCI VALHALLA WW 4-13-74-9

LOCATION: F1/04-13-074-09W6/0 **LICENCE NO.**: 0145370

OCCURRENCE:

BLOW: **BLOWOUT**: X **DATE**: 16 SEP 1990 **DURATION**: 4 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING**: **OTHER**:

LICENSEE: PETRO-CANADA

CONTRACTOR: ATCO DRILLING LTD. RIG #1

FORMATION: WAPITI **DEPTH**: 139 m

FORMATION PRESSURE: 1565 kPa **or DRILLING FLUID DENSITY**: 1150 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: While cementing the production casing, loss of circulation occurred. This caused an abnormally pressured water zone to flow uncontrolled. An attempt to shut in the well resulted in water broaching to surface around the conductor casing.

CONTROL PROCEDURES: Casing was perforated at 127 mm and the lost circulation zone was plugged. Cement was then pumped through the perforations to surface, successfully controlling the well.

CAUSE OF BLOW/BLOWOUT: Human error – Drilling into artesian water flow area.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Thoroughly research drilling records for hole problems prior to commencing operations especially in new areas of development.

HYDROCARBON AND/OR EQUIPMENT LOSS: None.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: RENAISSANCE ATLEE BUFFALO 6-22-22-6

LOCATION: 00/6-22-22-6W4/0 **LICENCE NO.:** 0144021

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 21 AUG 1990 **DURATION:** 3 DAYS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: RENAISSANCE ENERGY LTD.

CONTRACTOR: PRECISION DRILLING (1987) LTD. RIG #11

FORMATION: GLAUCONITIC **DEPTH:** 877 m

FORMATION PRESSURE: 9200 kPa **or DRILLING FLUID DENSITY:** 1160 kg/m^3

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: While tripping out of the well for a bit change, a kick occurred and was undetected until gas reached surface. The bit was at 534 m. All mud was blown from the well. The flow was directed to flare through the choke manifold.

CONTROL PROCEDURES: Several circulations of weighted drilling mud over a period of 2 days were required to kill the well. Complicating the kill procedure was the inability to run back to bottom with the drill pipe. The well was eventually controlled using the low choke method and pipe was run back to bottom to complete the well kill.

CAUSE OF BLOW/BLOWOUT: Human error – Swabbing while tripping. In addition, the Milk River formation may have contributed the cause by slowly feeding gas into the mud and reducing its density.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Ensure sufficient mud density is achieved prior to tripping to offset swab pressure losses.

HYDROCARBON AND/OR EQUIPMENT LOSS: 400 x 10^3 m^3 sweet natural gas.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: RENAISSANCE KENT 1-31-61-3

LOCATION: 00/01-31-061-03W4/0 **LICENCE NO.:** 0145362

OCCURRENCE:

BLOW: X **BLOWOUT:** **DATE:** 29 SEP 1990 **DURATION:** 6 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: X **SERVICING:** **OTHER:**

LICENSEE: RENAISSANCE ENERGY LTD.

CONTRACTOR: ATCO DRILLING LTD. RIG #5

FORMATION: UNKNOWN **DEPTH:** 199 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: DRILLING.

DESCRIPTION OF EVENT: The well blew in while making a connection at 199 m.

CONTROL PROCEDURES: Used drillers method (mud up and kill). Abandon well with cement plug.

CAUSE OF BLOW/BLOWOUT: Overpressured zone/unknown.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Flag area to indicate potential for shallow gas.

HYDROCARBON AND/OR EQUIPMENT LOSS: Sweet gas too small to measure.

INJURIES: None.

BLOW/BLOWOUT SUMMARY

WELL NAME: WEST-CAN ET AL WETASKIWIN 7-31-45-23

LOCATION: 00/07-31-045-23W4/0 **LICENCE NO.:** 0066384

OCCURRENCE:

BLOW: **BLOWOUT:** X **DATE:** 2 MAY 1990 **DURATION:** 16.75 HOURS

OPERATION AT THE TIME OF OCCURRENCE:

DRILLING: **SERVICING:** **OTHER:** X

LICENSEE: TWIN RICHFIELD OILS LTD.

CONTRACTOR: N/A

FORMATION: CLEARWATER **DEPTH:** 1323.4 - 1324.1 m

FORMATION PRESSURE: or **DRILLING FLUID DENSITY:**

STATUS OF WELL AT TIME OF OCCURRENCE: CAPPED GAS WELL.

DESCRIPTION OF EVENT: While cultivating, a farmer struck a wellhead and knocked off the wing valve on the tubing spool.

CONTROL PROCEDURES: A pumping unit was tied into the wellhead tubing and pumped freshwater down the tubing until returns were obtained at surface, killing the flow.

CAUSE OF BLOW/BLOWOUT: Third party damage, farmer struck the wellhead with a cultivator.

ACTIONS TO PREVENT FUTURE OCCURRENCES: Install adequate barriers of fencing around the wellhead.

HYDROCARBON AND/OR EQUIPMENT LOSS: 40 x 10^3m^3 sweet gas, damaged nipple and wing valve.

INJURIES: None.

APPENDIX - DEFINITIONS

Some definitions of terms used in the Drilling Rig Inspections section in this report are:

Active Rig	A rig that drilled at least one well in 1990.
Blow	The uncontrolled flow of wellbore fluids (gas, oil, water, mud) to the atmosphere. The flow is shut-in with the wellhead valve or blowout prevention equipment, or directed to the flare system if the well cannot be shut-in indefinitely without exceeding the maximum allowable casing pressure (MACP). * MACP – maximum allowable casing pressure, which if exceeded could result in fracturing the formation at the surface or intermediate casing shoe.
Blowout	The complete loss of control of the flow of fluids from the well or the flow of fluids from one underground reservoir to another (underground blowout). Wellbore fluids are venting uncontrolled at or near the wellbore and control can only be regained by installing or replacing equipment to shut-in or kill the well, or by drilling a relief well. (ie. An uncontrolled flow up through the drill pipe, or drill pipe blowout preventer stack annulus or below the bottom most blowout preventer.) Notes: • The installation of snubbing equipment to run pipe back to bottom in order to kill a blow does not constitute a blowout if all other BOP equipment is functioning properly. • The replacement of any components of the BOP stack or bleed-off system that can be safely facilitated by either temporarily shutting-in the well or by diverting the flow through auxiliary lines does not constitute a blowout.
Kick	Any entry of water, gas, oil, or other formation fluid into the wellbore.
Lost Circulation	The loss of drilling fluids from the wellbore into permeable formations penetrated by the well.
Sour Gas	Natural gas, including solution gas containing H_2S.
Sour Well	Any oil or gas well expected to encounter sour gas-bearing formations during drilling or any oil or gas well capable of producing sour gas.
Water Flow	An influx of water into the wellbore from a formation penetrated while drilling that may present problems in maintaining hole integrity.

Operations at time of blow or blowout

– Drilling	Original operation to drill a well or subsequent deepening of a well.
– Servicing	Servicing operations at a well involving completion, stimulation, special testing, recompletion, or changing downhole equipment (often called workovers).